Syllabus: Practices & Policies

2021-2022	Franklin High School

Section 1: Course Overview

Course Title	Advanced Algebra
Instructor Info	Name: Robert Haserot Contact Info: rhaserot1@pps.net
Grade Level(s)	
Room # for class	Room: Various
Credit	Type of credit: Math # of credits per semester: 0.5
Prerequisites (if applicable)	
General Course Description	This course continues the exploration of Algebraic concepts that began in Algebra ½. We will take a deeper dive into similar topics as well as explore new ones.

Section 2: Welcome Statement & Course Connections

Personal Welcome	Welcome to Advanced Algebra!
Course Highlights *(topics, themes, areas of study)*	This course emphasizes modeling data and problem situations with functions, specifically linear, quadratic, polynomial, exponential, rational, radical and logarithmic functions. The course also introduces students to topics which may include sequences and series, solving systems with and without matrices, complex numbers, problems in trigonometry, and some discrete topics such as probability. Students deepen their understanding of these topics as they work both individually and in groups to solve problems, apply the mathematics, and

	communicate their reasoning.
Course Connections to PPS ReImagined Vision	• **Excellence** ○ *I believe in rigor and high standards for all students and staff, and that achieving excellence and high performance is the result of the school system acting as a continuous learning organization.* • **Respect** ○ *I believe in respect for all. Every person brings value and deserves to be treated with care, courtesy, and compassion.* • **Relationships** ○ *I believe that relationships are vital to our success. Authentic human connection, established through kind, caring relationships, builds trust, fosters understanding, and strengthens our ability to work together toward shared aspirations.*

Section 3: Student Learning

Prioritized Standards	The following standards will be explored in the course: **Unit 1: Equations and Inequalities** **Priority Standards:** HSA.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* HSA.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **Supporting Standards:** HSA.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. HSA.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.* **Unit 2: Parent Graphs** **Priority Standards:** HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is*

	*increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.** **HSF.IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.* **HSF.IF.C.7.B** Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. **HSF.BF.B.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. **HSF.IF.B.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.** **Supporting Standards:** **HSF.IF.C.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **HSA.SSE.B.3.A** Factor a quadratic expression to reveal the zeros of the function it defines. **HSA.SSE.B.3.B** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. **HSG.GPE.A.2** Derive the equation of a parabola given a focus and directrix. **HSF.BF.A.1** Write a function that describes a relationship between two quantities.* **Unit 3: Inverses** **Priority Standards:** **HSF.BF.B.4** Find inverse functions. **HSF.BF.B.4.A** Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. *For example, f(x) =2 x3 or f(x) = (x+1)/(x-1) for x ≠ 1.* **Unit 4: Logarithms and Exponentials** **Priority Standards:** **HSF.LE.A.4** For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. **HSF.IF.C.7.E** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. **Supporting Standards:** **HSF.IF.B.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.** **HSF.IF.C.8.B** Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.

HSF.BF.A.1.A Determine an explicit expression, a recursive process, or steps for calculation from a context.
HSF.BF.A.1.B Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*
HSA.SSE.A.1.B Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*

Unit 5: Complex Numbers and Roots
Priority Standards:
HSN.CN.A.1 Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with *a* and *b* real.
HSN.CN.A.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
HSN.CN.C.7 Solve quadratic equations with real coefficients that have complex solutions.

Unit 6: Polynomials
Priority Standards:
HSA.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
HSA.APR.B.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
HSF.IF.C.7.C Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Supporting Standards:
HSA.APR.B.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number *a*, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
HSA.APR.C.4 Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.*
HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.*
HSA.SSE.A.1.A Interpret parts of an expression, such as terms, factors, and coefficients.
HSA.SSE.A.1.B Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*
HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**
HSF.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them

Unit 7: Rational Expressions

Priority Standards:

HSA.APR.D.6 Rewrite simple rational expressions in different forms; write $^{a(x)}/_{b(x)}$ in the form $q(x) + {}^{r(x)}/_{b(x)}$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.

Supporting Standards:

HSA.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

HSA.SSE.B.3.A Factor a quadratic expression to reveal the zeros of the function it defines.

HSN.RN.B.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational

Unit 8: Trigonometric Functions

Priority Standards:

HSF.TF.A.2 Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

HSF.TF.B.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.*

HSF.IF.C.7.E Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Supporting Standards:

HSF.TF.A.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

HSF.TF.C.8 Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.

HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**

Unit 9: Statistics

Priority Standards:

HSS.ID.A.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve

Supporting Standards:

HSS.IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

HSS.IC.A.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*

	HSS.IC.B.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. **HSS.IC.B.4** Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. **HSS.IC.B.5** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **HSS.IC.B.6** Evaluate reports based on data.
PPS Graduate Portrait Connections	I will help students grow their knowledge and skills in the following aspects of PPS's Graduate Portrait: • Students will be inclusive and collaborative problem solvers through utilizing teamwork. • Students will become resilient and adaptive lifelong learners. • Students will be inquisitive critical thinkers with deep core knowledge by creating and examining mathematical arguments. • Students will become powerful and effective communicators through explaining and sharing their work and thinking.
Differentiation/ accessibility strategies and supports:	I will provide the following supports specifically for students in the following programs: *Special Education, 504 Plans, English Language Learners and Talented & Gifted:* • Explicit instruction using guided notes and teacher-provided notes (available through canvas) • Leveled, standards-based assessments with clear benchmarks for C-, B- and A-level work. • Flexible timeline for demonstrating proficiency. • Multiple attempts to retake and/or revise assessments. • Honors credit available for interested students. • Clearly posted and chunked agenda, daily learning target(s). • Investigative, problem-based curricular model to attend to CCSS Mathematical Practices of ○ 'making sense of problems and persevere in solving them'; ○ 'Reason abstractly'; and ○ 'look for and make use of structure,' for example.
Personalized Learning Graduation Requirements (as applicable in this course):	☐ Career Related Learning Experience (CRLE) #1 ☐ Career Related Learning Experience (CRLE) #2 *-The experience(s) will be:* ☐ Complete a resume ☐ Complete the My Plan Essay

Section 4: Cultivating Culturally Sustaining Communities

Tier 1 SEL Strategies	
Shared Agreements 	I will facilitate the creation of our Shared Agreements that respects and celebrates each student's race, ability, language, and gender in the following way(s): ● Students will create class norms during the first class of the year as a whole
	I will display our Agreements in the following locations: ● Class norms will be posted in our classroom
	My plan for ongoing feedback through year on their effectiveness is: ● Revisit the classroom norms throughout the year during daily instruction ● Students will get feedback on their formal classwork and receive informal feedback during class time
Student's Perspective & Needs 	I will cultivate culturally sustaining relationships with students by: ● Communicating with students every single class period using their preferred name. I will provide time and space during class to share with classmates and myself about themselves. I will check in with students individually every class about classwork and their general well-being
	Families can communicate what they know of their student's needs with me in the following ways: ● Email is the best way to reach me: rhaserot1@pps.net

Empowering Students 	I will celebrate student successes in the following ways: ● Provide positive reinforcement ● Provide positive feedback paired with constructive feedback to both students and parents
	I will solicit student feedback on my pedagogy, policies and practices by: ● Regular survey questions are included in the exit ticket. These will cover: ○ student understanding ○ pace of class ○ clarity of materials/activities ○
	When class agreements aren't maintained (i.e. behavior) by a student I will approach it in the following ways: ● I will remind students about our class agreements and pursue a deeper understanding of a student's behavior/action with curiosity. Norms/Agreements are also enforced by the group, not necessarily the teacher. ● I will document the student behavior and contact home if behavior continues. I will reach out to school partners such as Step-Up, SUN, counselors, coaches, other teachers and support staff.
Showcasing Student Assets 	I will provided opportunities for students to choose to share and showcase their work by: ● Small group share outs ● Opportunities for students to share out to the whole class

Section 5: Classroom Specific Procedures

Safety issues and requirements (if applicable):	● Masks will be required, covering noses & mouths, during the duration of the period ● If students need to take a prolonged break without their mask on, they will have space to do so outside of the classroom ● Following PPS guidelines students will be separated by 3' ***to the extent possible.*** ● **No Food** will be allowed to be consumed during the class period.

Coming & Going from class	Upon arrival please locate your name tent and be prepared to receive additional instructions. Prior to departure students are asked to remain at their seats until the bell rings.
Submitting Work	I will collect work from students in the following way: ● Online through Canvas, Google Forms or Desmos. ● Assessments may be handed in on paper or completed through an online platform.
	There are no due dates for assignments.
Returning Your Work	My plan to return student work is the following: ● Exit tickets will immediately return correct answers and feedback to students. ● Revision Opportunities: there will be revision opportunities on all assessments.
Formatting Work (if applicable)	Directions on how to format submitted work (ex. formal papers, lab reports, etc) can be found here: N/A
Attendance	If a student is absent, they can get caught up by reviewing the lesson in **Canvas**. The lesson will include: ● A copy of blank notes ● A copy of teacher notes ● A copy of practice problems ● An answer key to practice problems ● A link to the activity (**if there is an activity on that day)** ● A link to the Exit Ticket.

Section 6: Course Resources & Materials

Materials Provided	I will provided the following materials to students: ● Paper ● Tools (Rulers, Compass, Protractors, Calculators)

Materials Needed	Please have the following materials for this course: ● Writing Utensil - Pencil ● 3 Ring Notebook ● PPS provided Chromebook or similar device. *Franklin can help with any materials you may need as well. Please reach out to me privately and I will help you get what you need.*
Course Resources	Links will be provided in **Canvas.** Linked resources will include: ● Class notes and practice problem answer keys. ● Desmos activities (an interactive online math platform for activities) ● Khan Academy Videos
Empowering Families	The following are resources available for families to assist and support students through the course: ● Class notes and practice problem answer keys. ● Desmos activities (an interactive online math platform for activities) ● Khan Academy Videos
Section 7: Assessment of Progress and Achievement	
Formative Assessments	As students move through the learning journey during specific units/topics, I will assess & communicate their *progress* in the following ways: ● Regular feedback on formative and summative assessments
Summative Assessments	As we complete specific units/topics I will provide the following types of opportunities for students to provide evidence of their *learned* abilities: ● Summative assessments ● Opportunities for alternative assessment method (oral, project-based)

Student Role in Assessment	Students and I will partner to determine how they can demonstrate their abilities in the following ways: ● Students will have an opportunity to show me what else they learned that I did NOT ask them about on an assessment.

Section 8: Grades
Progress Report Cards & Final Report Cards

Accessing Grades	Students & Families can go to the following location for <u>up-to-date</u> information about their grades throughout the semester: ● Student-Vue/Parent-Vue
	I will update student grades at the following frequency: ● After every assessment
Progress Reports	I will communicate the following marks on a progress report: ● Mark: **Pass** (the student is demonstrating proficiency) ● Mark: **No Pass** (the student has not ***yet*** demonstrated proficiency)
Final Report Card Grades	The following system is used to determine a student's grade at the end of the semester: ● Each Unit will have an assessment. ● There will be a cumulative final exam. ● The assessments and exam will be equally weighted. ● The cumulative grade will be the average of all Unit assessments and the Semester final exam. ● A letter grade of A through F will be assigned based on the average ○ **> 89 % = A, > 79 % = B, > 69 % = C, > 59 % =D, and , 59% = F**
	I use this system for the following reasons/each of these grade marks mean the following: ● Overall grade should reflect individual student ability, which will primarily be assessed during summative assessments.

Other Needed info (if applicable)	